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(12) **United States Patent**  
**Chen**

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(54) **PACKAGE OF ENVIRONMENTALLY SENSITIVE ELECTRONIC DEVICE AND FABRICATING METHOD THEREOF**

(58) **Field of Classification Search**  
CPC ..... H05K 3/284; H05K 1/189  
See application file for complete search history.

(71) Applicant: **INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE**, Hsinchu (TW)

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,288,989 A 2/1994 Ishaque et al.  
5,730,919 A 3/1998 Wilfong et al.  
(Continued)

(72) Inventor: **Kuang-Jung Chen**, Zhubei (TW)

(73) Assignee: **INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE**, Hsinchu (TW)

FOREIGN PATENT DOCUMENTS

CN 1591527 A 3/2005  
CN 101562233 A 10/2009  
(Continued)

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OTHER PUBLICATIONS

(21) Appl. No.: **14/192,401**

M. M. R. Howlader et al., A Novel Bonding Method for Ionic Wafers, IEEE Transactions on Advanced Packaging, 2007, p. 598-604, vol. 30, No. 4.

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*Primary Examiner* — William H Mayo, III

*Assistant Examiner* — Hiram E Gonzalez

(74) *Attorney, Agent, or Firm* — Locke Lord LLP; Tim Tingkang Xia, Esq.

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(57) **ABSTRACT**

A package of an environmentally sensitive electronic device and a fabricating method thereof are provided, wherein the package may include a first substrate, a second substrate, the environmentally sensitive electronic device, a packaging body, and a filler. In one or more embodiments, the environmentally sensitive electronic device may be disposed on the first substrate and located between the first substrate and the second substrate. The filler is disposed between the first substrate and the second substrate and covers the environmentally sensitive electronic device. The packaging body is sandwiched between the first substrate and the second substrate and encloses the environmentally sensitive electronic device and the filler. A material for the packaging

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